

Executive Summary

Updated as of March 21, 2008

Evaluation of Releases from Grinding and Burning Of Residential Building Debris from Hurricane Katrina

UPDATE OVERVIEW

The purpose of this update is to present the revised figures for the maximum number of houses that will be required for the burn and grind program. Upon further evaluation of the capacities of the volume reduction equipment that will be used in the program, the maximum number of houses that will be processed will now be as follows:

New Maximum Number of Houses:

- 3 residences not containing asbestos for the burner test.
- 3 residences containing asbestos for the burner test.
- 6 residences containing asbestos for the grinder test.

The previous figures had been 12 houses for each of the tests. The risk assessment that had been used to establish the safety of the 12 house test program remains valid for the reduced number of houses that will be used for the test program. The project Quality Assurance Program Plans (QAPPs) and the Health and Safety Plan will be revised to address these new lower numbers of houses.

BACKGROUND

On August 29, 2005, Hurricane Katrina made landfall on the Gulf Coast. The hurricane damaged the coastal regions of southern Louisiana, southern Mississippi, and southern Alabama. Approximately 260,000 residential buildings in the State of Louisiana were identified as structurally unfit for reoccupation.

The State of Louisiana requested assistance in this massive effort of demolition, debris handling, and ultimately volume reduction and final disposal of the waste material. Given the enormous volume of vegetative and building debris created by Hurricanes Katrina and Rita, combined with the restrictions on debris transport imposed by the Formosan termite quarantine, there is a continued need for safe approaches for reducing the volume of waste requiring disposal. Utilization of grinders and Air Curtain Destructors (ACDs) has been proposed as potential means for volume reduction of the debris.

Although the State of Louisiana anticipated following the work procedures specified in EPA's Asbestos National Emission Standard for Hazardous Air Pollutants (NESHAP), 40 CFR Part 61, Subpart M, to minimize the potential release of asbestos

into the air, the extraordinary scope of the problem made it extremely difficult to manage these wastes using conventional practices. The Asbestos NESHAP specifies emission control procedures [§61.145 (c)] and waste disposal requirements [§61.150] that must be followed during demolition of a facility that contains asbestos above the threshold amount. The State therefore requested that EPA's Office of Enforcement and Compliance Assurance (OECA) issue a *No Action Assurance* (NAA) letter regarding Asbestos NESHAP. The NAA letter would permit the State of Louisiana to use modified procedures to demolish residential buildings that contain RACM, but were no longer habitable.

EPA's Region 6 along with the Office of Research and Development felt it important to the Nation as a whole to evaluate methods of reducing these large volumes of waste caused by a natural disaster. The proposed pilot project will evaluate 1) Grinding- the handling and grinding operation to reduce debris volume and 2) Burning- the handling and burning in an Air Curtain Destructor (ACD) to reduce debris volume. The project is proposed to be conducted at the Paris Road Landfill in St Bernard Parish in Louisiana.

OBJECTIVES

The objectives of the pilot study to reduce debris volume using the Air Curtain Destructor (ACD) Technology and the Grinder are as follows:

| The primary objective of the study is to determine whether asbestos is released into the air during either process.

The secondary objectives are:

To develop recommended operating procedures and monitoring techniques to assure effective ACD performance if this technology is used in this and future responses.

To determine whether any asbestos is emitted from the volume reduction processes and whether these potential emissions are statistically greater than the background asbestos concentrations.

During the burning evaluation, ambient air will be tested for the potential presence of additional target analytes, including asbestos forms, metals, particulate emissions as total filterable particulates and as PM_{2.5}, and polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). In addition, several analytes will be measured in the source emissions from the ACD. These will include lead, other metals, selected organic compounds, and criteria pollutants.

During the grinding evaluation, ambient air will be tested for the potential presence of additional target analytes, including asbestos forms, metals, and particulate as PM₁₀.

During both evaluations, output samples (burner ash and grinder debris) will be analyzed to assess disposal requirements.

During both evaluations, workers will be tested for potential exposure to asbestos fibers and lead concentrations. For the burner evaluation, workers will be tested for potential carbon monoxide exposure.

During both evaluations, the volume reduction achieved by the two processes will be estimated.

ASBESTOS AND LEAD INSPECTION OF BUILDINGS

Asbestos—Candidate residential buildings will be inspected by a State of Louisiana Department of Environmental Quality (LDEQ) licensed Asbestos Consultant to determine the amount of asbestos present in the buildings as is practical and safe. A contractor will transport residential building debris that do and that do not contain asbestos-containing materials to the site, and will stockpile and catalog the houses as asbestos-containing or non-asbestos containing for the study.

To accomplish the requirements of the sampling protocol, 6 RACM houses are projected to be needed for the grind evaluation and 6 houses (3 non-RACM and 3 RACM) will be needed for the burn.

Lead in Paint—Lead in paint film (“paint chip”) samples will be collected from the interior finishes (painted gypsum wallboard and millwork) and from the exterior surfaces (clapboard siding and window sash/frame) from each of the buildings.

SITE SPECIFIC SAMPLING

The figure below shows the area at the Paris Road Landfill that will be used for the testing and data gathering. The area is remote from occupied residences (greater than 1000 feet). The same area of the landfill will be selected for both the burn and the grind.



Paris Rd Landfill Sampling Areas

The sampling outlined in the objectives will consist of two sampling rings around the center of both the ACD operation and the grinder operation. The inner sampling ring will be located between 60 to 75 feet from the actual ACD and Grinder. The outer sampling ring will be approximately 300 feet from the center of the two operations. Each ring will consist of 18 asbestos samplers evenly spaced around the ring.

In addition, ambient air samplers will be placed at the five numbered locations identified in the photograph. These locations will include:

- Location 1. West of the trailers at the URG Office compound
- Location 2. Inside the fence on the URG/Parish property west of Paris Road
- Location 3. West of the Motel on Paris Road
- Location 4. West of SDT Transfer Station
- Location 5. West of the URG Inspection tower

TIMING AND TEST CONDITIONS

The field sampling portion of the study for both the grind and the burn should not exceed six weeks; however it is expected to be completed in a two-week period. The actual amount of time that the grinder will be in operation should not exceed 24 hours of run time. It is expected that the grinding test and monitoring will consist of three consecutive four-hour runs. Monitoring of the grinder will occur over two days. The first day will consist of two four-hour runs and the second day will have one four-hour run using asbestos containing debris.

The actual amount of time that the ACD will be in operation should not be expected to exceed 54 hours of burn time. It is expected that the monitoring of the ACD will occur over four days. The first day will be a shakedown with vegetative debris to determine the operating procedures that will be used during burning of the residential building debris. EPA ORD will collect samples from the ACD exhaust emissions during this period as a baseline for comparison.

Over the next two days, three four-hour test runs will be performed during which non-asbestos containing residential debris will be burned. EPA ORD will sample emissions from the ACD exhaust during this period.

Following these tests, three four-hour test runs will be performed during which asbestos-containing residential debris will be burned. EPA ORD will sample the emissions from the ACD exhaust during this period. EPA ORD will also conduct the ambient air monitoring during these tests.

These estimates are based on good weather and no major equipment malfunction.

METEOROLOGICAL MONITORING

A portable meteorological station will be used to record 5-minute average wind speed and wind direction data, as well as temperature, barometric pressure, and relative humidity. Monitoring will not be conducted during rain conditions. Should light rain be encountered, monitoring will cease until the rain stops. For this study, if sustained wind speeds in excess of 20 mph (60-minute average) are encountered, monitoring will pause and process feeding will be discontinued until the wind speed is less than these conditions. The maximum limits were established to attempt to prevent the higher winds speeds from excessively modifying the micrometeorology. Operations will resume upon the winds returning to stable conditions for 15-minutes minimum allowable within the confines of the test, or will be delayed until satisfactory conditions exist. Wind conditions at the site will be continuously monitored by the onsite weather station.

SAFEGUARDS

EPA will employ a set of safeguards to ensure protection of the surrounding community, the environment, and workers during the test program. These safeguards include:

Location:

The Paris Road facility itself is relatively isolated from populated areas. The areas selected for potential test locations abut water on at least one side. In addition, the potential locations for the test burner on the grounds are at least 1800 feet from the inhabited trailers in the URG parking lot.

Test Phasing:

As stated previously, the testing will be phased in such a manner that burning will first occur with only vegetative materials. The first day of testing will be directed toward establishing optimum conditions for combustion of this vegetative matter. Testing will then proceed with demolition debris that contains no asbestos so that appropriate operating conditions may be established for this material. The testing of the demolition debris without asbestos will occur over a two day period. Finally, if/when it is established that stable operating conditions can be maintained, 12 hours of testing on demolition debris containing asbestos will take place.

Operation of the burner with asbestos containing material will be conducted during an appropriate time so as not to interfere with operations at the Paris Road Facility. Most likely, testing with asbestos containing material will take place on a weekend.

Meteorological Protections:

No operation of either the grinder or the burner will occur if wind velocities are in excess of 20 miles per hour. Wind direction can be variable and unpredictable at this time of the year. However, no operation of the burner and grinder will be initiated if the prevailing wind direction is toward the nearest occupied structures.

Feed Preparation and Control:

The debris material containing asbestos will be kept in a wet condition to mitigate against any air emissions during the storage and feeding of materials into the grinder and the burner. The grinder will be operated with a misting system to ensure that the debris will be processed in a wet condition for plume suppression. EPA has reassessed its initial estimates of houses to be processed in the test program. While actual quantities are expected to be lower, a maximum of 12 demolished residences will be processed as follows:

- 3 residences not containing asbestos for the burner test.
- 3 residences containing asbestos for the burner test.
- 6 residences containing asbestos for the grinder test.

These new maximum quantities of houses to be processed take the place of the previous estimates of 12 residences for each of the tests. The screening level risk assessment was conducted on the basis of the 12 houses per test and is still applicable for the revised and reduced maximum number of houses for the test program. All Safeguards described herein remain valid for the test program.

Process Controls:

The unit employed for the grinder test will be a low speed grinder. A water misting system will be used to suppress air emissions during the operation of the grinder.

Real-time monitoring of combustion conditions at the burner will include measurements of temperature as well as emissions of carbon monoxide, carbon dioxide, and total hydrocarbons to ensure that the combustor is operating properly.

For the purposes of these studies, stable-operating conditions will be defined as those where opacity does not exceed average values greater than 20% for a period exceeding 30 minutes.

If the operation of the unit while burning the non-ACM containing houses cannot be stabilized (as defined above), the unit will be brought into an orderly shutdown by terminating the feed of C&D debris and introducing vegetative debris for an hour until the unit is essentially operating on vegetative debris. At this point, operation of the unit will be terminated or an alternate feeding arrangement for C&D debris will be attempted.

In addition, upwind and downwind CO and particulate will be measured and compared to OSHA levels. If CO exceeds OSHA-defined levels of 1200 ppm at any time, the test will be brought to an orderly shutdown.

If a satisfactory operating regime cannot be ascertained while burning the non-ACM containing housing stock, then the ACM-containing experiments will not be initiated.

Worker Safety Monitoring:

EPA, its contractors, and any other workers at the site during the testing will be monitored in compliance with OSHA rules. This monitoring will include personal monitors for asbestos.

Screening Level Preliminary Risk Assessment:

To ascertain that the proposed testing would not constitute a risk to potentially exposed people, EPA's Office of Research and Development conducted screening level risk assessments of two worst case scenarios. Screening level risk assessments are inherently conservative in that they utilize built in conservative assumptions due to the uncertainty of the situation.

EPA's SCREEN3 air dispersion model was used to estimate air impacts downwind of the ACD. SCREEN3 uses a Gaussian plume model (ISC-ST) that incorporates source related factors and meteorological factors to estimate pollutant concentration from sources. It is assumed that the pollutant does not undergo any atmospheric chemical reactions or transformations, and that no other removal processes, such as wet or dry deposition, act on the plume during its transport from the source. SCREEN3 examines a range of stability classes and wind speeds to identify the "worst case" meteorological conditions, i.e., the combination of wind speed and atmospheric stability that results in the maximum ground level concentrations.

Despite the fact that EPA will not operate the burner if the wind direction is toward the occupied structures, this model was operated under the assumption that the prevailing wind direction was toward the structures and the wind speed was at least 20 miles per hour, the upper limit for the test conditions. Also, in each case, the assumption was made that the combustion process had no effect on the asbestos material, that is, asbestos exited the combustor in the exact same form that it entered the burner.

Two scenarios were evaluated. Both scenarios assumed a 1500 square foot residence with an exterior fully covered with transite asbestos siding containing chrysotile asbestos at 20 percent by weight. This gives us 2670 pounds of transite or 534 pounds of chrysotile asbestos per house. It is assumed that the houses are fed into the burner at the maximum steady rate of one house per hour.

Scenario 1. This scenario uses an emission rate of asbestos from the ACD that should be considered as "reasonable worst-case" of potential emissions, because it assumes that asbestos in the waste is emitted to the air in relation to particulate matter emissions during combustion and that 100% is in the form of chrysotile. EPA has field data for particulate emissions for ACD burners operating on vegetative matter of approximately 0.1 pounds of particulate emissions per ton of debris. The official EPA emission factor is 13 lb. of particulate emissions per ton of debris. For a "reasonable worst case scenario", we assumed that ACD unit would emit asbestos at a rate of 10 times the emission factor for particulate emissions. Therefore, the emission factor used was 130 pounds of asbestos emitted per ton of asbestos fed to the burner. This amounts to an assumption of 35.51 pounds of asbestos emitted every hour during the test. The nearest residence is 564 meters downwind of the ACD.

Scenario 1 Modeling assumptions:

1. Emission rate: 4.47 g/s asbestos
2. ACD was treated as a volume source
3. Release height of emissions: 2.5 m
4. Residential area is 564 m downwind of emission source.

Scenario 1 Results:

Three Cases were evaluated:

1. The ACD operating for 24 hours per day, 365 days per year, for 70 years.
Additional cancer risk of 1 in one million

2. The ACD operating for 24 hours per day for one year.
Additional cancer risk of 2 in 100 million
3. The ACD operating for 24 hours per day for three days.
Additional cancer risk of 6 in 100 billion

Scenario 2. This scenario uses an emission rate of asbestos from the ACD that should be considered as "high end" and "worst-case", because it assumes that all asbestos in the waste is emitted to the air during combustion of the demolition debris (torn down houses) and that 100% is in the form of chrysotile. This scenario assumes that all 534 pounds of asbestos fed into the burner every hour is emitted as particulate and none is chemically converted or reports as bottom ash. Again, the nearest residence is 564 m downwind of the ACD.

Scenario 2 Modeling Assumptions:

1. Emission rate: 68 g/s asbestos
2. ACD was treated as a volume source
3. Release height of emissions: 2.5 m
4. Residential area is 564 m downwind of emission source.

Scenario 2 Results:

As in Scenario 1, three cases were evaluated:

1. The ACD operating for 24 hours per day, 365 days per year, for 70 years.
Additional cancer risk of 2 per one hundred thousand
2. The ACD operating for 24 hours per day for one year.
Additional cancer risk of 3 per ten million
3. The ACD operating for 24 hours per day for three days.
Additional cancer risk of 9 per 10 billion

Discussion of Risk Assessment Results:

The two scenarios and the six cases are presented to provide perspective. Scenario 1, Case 3 and Scenario 2, Case 3 are the only cases that come close to depicting the conditions of the pilot test burn. In each case, despite the pyramiding conservative assumptions, the computed additional risk is well below one in one billion.

Additional Ambient Air Monitoring:

In addition to the process monitoring described above EPA will place ambient high volume air samplers at the five sampling locations previously identified. These monitors will observe asbestos, metals, and other contaminant concentrations before and after the testing program. Monitoring locations will include:

- Location 1. West of the trailers at the URG Office compound
- Location 2. Inside the fence on the URG/Parish property west of Paris Road
- Location 3. West of the Motel on Paris Road
- Location 4. West of SDT Transfer Station
- Location 5. West of the URG Inspection tower

INTERIM REPORTS

At the end of each test day, available continuous data will be reduced, where possible, and analyzed to determine if it is appropriate to proceed to the next test. It is likely that only opacity, carbon monoxide, carbon dioxide, hydrocarbon, and possibly limited particulate data will be available at the end of each test day. Concentrations and emission rates will be calculated where possible prior to the next test run.

FINAL REPORTS

The draft final report on the project will be due 90 days from the end of the field sampling. The final reports will be released after review to ensure data quality requirements have been met and technical peer review of the project's approach and conclusions.